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# INDUSTRIAL EXTENSION SERVICES FOR SMALL-SCALE INDUSTRIES

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# INDUSTRIAL EXTENSION SERVICES FOR SMALL-SCALE INDUSTRIES

## I. SCOPE OF INDUSTRIAL EXTENSION SERVICES

The measures of promotion of, and assistance to, prospective entrepreneurs discussed in the preceding section are the first steps in a programme of development of small-scale industry. A further step is to provide counselling and assistance to established industrialists. The transmission of knowledge and expertise to persons engaged or interested in industrial activities is frequently referred to as industrial extension service. 1/

In a broad sense, this concept covers, first, all activities extended for and within the undertaking, which tend to induce and facilitate the establishment of new industrial enterprises and to assist the operation and management of existing ones, and, second, some activities, peripheral to the industrial undertaking, which have a bearing on its modernization, upgrading and growth. The peripheral activities include technological research, technical education, pilot plants and other demonstration projects. In most cases, these relate to industry in general, though special programmes focused on small industry development may be devised. The concept of industrial extension services will be used in this paper in the wider sense of advisory, training, research, demonstration and information activities for small-scale industries.

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1/ The term "extension service", originally applied to agricultural training and advisory services provided directly to farmers by roving teams of staff members and technicians of agricultural colleges and experimental stations in the United States, has often been used in the same sense to refer to counselling and advisory services provided to a small industrialist in his own plant. Industrial extension service has also been interpreted as extension of the knowledge of entrepreneur into new fields. The entrepreneur in a small-scale industry has usually to combine functions which, in a larger firm, are carried out by assistant managers, engineers, accountants, etc.; the "extension" of specialized services to a small entrepreneur constitutes, in that sense, an expansion of his staff resources, as well as an addition to his own knowledge and expertise. The above interpretations appear to be rather narrow and somewhat in the nature of semantic exercises aimed at giving meaning to an expression which, ambiguous as it may perhaps be, is nevertheless in common use.

This paper has been prepared by Mr. P. C. Alexander, Senior Technical Adviser, in co-operation with the Small-scale Industry Section, Centre for Industrial Development.

Industrial extension services are given to small-scale industries in four main areas: economic assistance; technical assistance; management development; and product improvement.

Economic assistance covers principally counselling on industry feasibility and prospects, selection of location, fixed and working capital requirements, assistance in obtaining credit, information on availability and prices of raw materials, labour, factory space, production costs of different size units, competitive position in relation to other industries, marketing prospects, profits, and so on. This is the basic advice required by a potential entrepreneur to take the first decisions on starting a new industry or by an existing firm to take decisions on expanding, improving or diversifying its activities.

Technical assistance covers advice and guidance on the choice of materials, machinery and tools and their most efficient utilization in production. It includes advice on the installation of machinery and equipment, plant lay-out, techniques and methods of production, maintenance and repair, testing, and class-room and on-the-job training of workers and supervisors.

Management development covers advice, guidance and training in all aspects of the conduct of a business, including raising of resources, organization, production planning and control, and marketing of products. It includes advice on sources of credit facilities, loan regulations, taxes, costing, bookkeeping, advertising, publicity, selling, sub-contracting, etc. The promotion of co-operative arrangements, including co-operative associations between small undertakings is a relevant activity.

Product improvement is concerned with design and quality. Existing design may be improved or new design substituted for the old one so as to enhance performance, quality and appearance. Advice is given on standardization, quality specifications and quality control.

Training is necessarily involved in the above activities, whether it is provided in an industrial extension centre, a special institution or on the job. As an industrial extension activity, the training provided to managers, supervisory personnel and workers of existing enterprises is, as a rule, more in the nature of upgrading of existing skills and more specialized than that given in business administration courses, technical education and vocational training, to students who have not entered yet into industrial employment.

Industrial research is an essential supporting activity. Technological adaptation or innovation in respect of processes, equipment and products is often of special benefit to small-scale industries. Some processes result in reductions in input of capital and materials; some types of equipment make it possible to produce economically at relatively small capacity or lend themselves to multiple use; some products may be based on local materials or by-products or may meet special demand requirements on narrow markets. An industrial extension service should evidently make use of the results of such research.

The effectiveness of industrial extension service for small-scale industries depends to a large extent on its integration with, and support by, a comprehensive development programme. Small entrepreneurs require not only advice and guidance on the right type of machinery and equipment or raw materials and so on, but also promotion measures of broader scope. Such supporting facilities include tax and customs incentives, credit assistance on easy terms, supply of machines on hire-purchase basis, factory accommodation through industrial estates and other measures. Industrial extension service would be incomplete and might even be ineffective in their absence.

## II. INDUSTRIAL EXTENSION POLICIES IN DEVELOPING COUNTRIES

### (1) Entrepreneurship development

In countries at early stages of industrial development there is necessarily very little demand for a counselling service designed to improve existing industries. In such countries the main problem is the stimulation of entrepreneurship and the main function of an industrial extension service should be to provide counselling and guidance leading to the establishment of new small-scale industries.

The techniques and methods of extension service for the promotion of entrepreneurship have been examined in the preceding section. A successful method followed in India in this field deserves mention here. This is the "intensive development campaign" organized in industrially backward districts with a view to publicizing and propagating the idea of industrialization by going to the people, instead of waiting for them to approach the agencies for assistance. The campaign is organized jointly by industrial extension agencies and other promotional agencies providing financial and physical facilities.

The first stage of the campaign is to survey the industrial potential of the area in which the campaign is to be conducted. Once the information on industries having prospects in the area is obtained, the industrial extension agencies launch a "contact" programme including convening of meetings and discussion groups, distribution of information literature and exhibition of industrial products and equipment through mobile demonstration vans. During the campaign, wide publicity is given to the various facilities and services the people can expect to get from the extension and promotion agencies if they decide to start any of the industries recommended. This is followed by individual contacts, provision of advice and guidance, facilitation of financing and other forms of assistance until the enterprise is set up. The "intensive development campaigns" have resulted in the establishment of new enterprises in agricultural areas by people who, without them, would not have been involved in industrial activities. While in India this method has been tried mainly in industrially backward districts, it is suitable for application in all areas in any developing country intending to stimulate the establishment of new enterprises.

(2) Selectivity in development

Transformation of artisans into small-scale industrialists

The preponderance of artisan trades and crafts in developing countries presents some special problems in industrial extension service. In most of these countries, the overwhelming majority of manufacturing establishments are of traditional types - cottage or household industries, artisan crafts and handicrafts. In many countries, in particular in newly-independent ones, there are no modern small-scale industries at all, the industrial structure consisting only of a few large-scale and medium-sized enterprises on the one hand, and of artisan and handicraft undertakings on the other. In any programme of industrialization, the future of the traditional group is an important question. Modern technology and industrial processes have made many of the traditional crafts obsolete and wasteful. Factories are steadily replacing artisan workshops in the supply of furniture, agricultural tools, textiles and other products. The emergence of new technologies and new products, changes in social structure and rising income levels have resulted in a reduction in demand for many artisan products.

The implication of these developments is that the promotion and industrial extension policies should be selective. This is not to say that the development of small-scale industry should be at the expense of the artisan and handicraft undertaking. There are certain fields where the artisan workshop can co-exist with the modern small factory and even, sometimes, function in complementarity with it. The scope, not only for survival, but for progress, is particularly great for crafts and trades which produce goods of artistic value and require artistic skill in production. These have an important place in any industrial economy and need to be supported and assisted, preferably by special agencies having at their disposal experts and technicians in artistic trades. Although such crafts cannot and need not be transformed into modern industries, there is much scope for modernization of their production and management.

In some developing countries, extension and in particular training programmes have been introduced to cover the whole range of traditional crafts with the result that declining skills and trades are sustained along with economically useful ones. In a few cases, attempts have been made by development planners to shelter traditional crafts from competition by modern factories through protective measures such as preferential tax incentives and concessions, price subsidies and even quantitative restrictions on production by modern factories. In the long run, such policies help neither the traditional craft nor the modern factory.

An industrial extension service should be concerned with those artisan trades which may play a positive role in a modern economy. It is the duty of an extension agency to identify such skills and crafts and to assist them to improve and develop further. The agency should also endeavour to divert artisans engaged in obsolete and declining trades towards more fruitful areas of industrial activity, so that modernization would not tend to destroy productive capacity, but on the contrary, would contribute to strengthening the industrial economy. This is very important in developing countries where technological unemployment can have disastrous results. The scope for such changes, however, is not uniform either as between or within the various trades.

A very promising line of development is to orient artisans, through adaptation or retraining, towards modern service and construction trades. With the change in the pattern of life in rural areas, the demand for the services of repair and service men for irrigation pumps, diesel engines, tractors, agricultural machinery, etc. has increased considerably and a major difficulty in agricultural programmes in developing countries is now the shortage of skilled workers in such trades. In urban areas, the services of the plumber, the electrician, the mechanic, the radio technician and the construction worker are in increasing demand, and it is good policy for industrial extension agencies to help traditional artisans to acquire these skills.

The scope for transformation of traditional artisans into modern small industrialists through mechanization and modernization in their own or related line is more limited than is commonly believed, but opportunities do exist for converting weavers, blacksmiths, cobblers and the like into textile manufacturers, hardware and tool producers, shoe manufacturers, etc.

As has been stressed earlier, the extension service should seek out prospective entrepreneurs, and not only wait for them. This is particularly necessary in the case of artisans in rural areas who may not have the initiative or motivation to approach the extension agency located in a far away town. The agency will even have to bring to them the workshop itself, for demonstration and training. The mobile demonstration workshop has been effectively tried for this purpose in several developing countries. Mobile vans equipped with simple machines are taken by the industrial extension staff to areas where there is a concentration of artisans, to introduce them to the new tools and techniques. Some artisans may be reluctant to accept any change. Some may require long periods of instruction and training. Many, however, take easily to new machines and tools. In most cases, the mobile demonstration workshop is for the artisans the first real contact with modern technology and there is evidence that it has succeeded in inducing them to modernize their tools and techniques.

A serious limitation to extension work in rural areas is the absence of electricity or other sources of power. Modernization usually means mechanization with use of power. While the availability of power is undoubtedly a prerequisite for industrialization, steps for the modernization of artisan

undertakings need not necessarily be postponed until power is provided. The process of transformation should be phased, and improved tools, machinery and techniques which do not require power should be introduced in the early and intermediate stages. This calls for selecting and, more often than not, devising appropriate technologies, a task which proves to be one of the most difficult in industrial extension service. Very little research has been done so far to evolve industrial technologies suitable for economies at different levels of development, and technologies for rural industrialization, in particular, have been almost completely neglected. The establishment of close links between industrial extension and research is a policy which should gain high priority in any plan or programme of industrial development.

Selective promotion of small-scale industries

In view of the scarcity of capital and skills in the developing countries, and of the competing claims of various economic and social development projects on the available resources, it is essential that small-scale industries should be promoted on a selective basis, taking into account their viability, competitive strength and growth potential. While smallness should not be a handicap, it should not by itself qualify for promotional assistance either.

As stressed in the preceding section, industrial extension agencies should identify the most promising lines of industrial development in various regions and localities, and steer prospective and existing entrepreneurs towards these. In the advanced countries, there is no need for any special agency to assume such a role, since entrepreneurs have sufficient information and can be expected to make proper decisions. In these countries, wrong decisions would not affect appreciably economic progress. In the developing countries, unguided development of small-scale industries might result in a wasteful deployment of scarce resources and in the establishment of weak and inefficient industries which might need to be artificially sustained by subsidies and other concessions. Failures, in these countries, may have a disastrous effect on further entrepreneurial initiatives. It is true that in all countries small-scale industries need some forms of support and protection. Selectivity in development programmes may reduce considerably the period and scope of measures of protection and assistance. Success in the establishment of small-scale industries may be expected to have a positive demonstration effect.

As a rule, an industrial extension agency should give assistance to all who come to it, without any discrimination as between entrepreneurs or types of industries. In a developing country, every initiative should be supported, every need for assistance met. In some cases, however, advising and helping an established entrepreneur to change his line of production may be a better solution than to assist him in keeping alive a precarious, inefficient and economically unsound undertaking.

Selecti ity in location

Selectivity in location of small industries is as important as selectivity in types of manufacturing activity. In most developing countries, the lack or inadequacy of infrastructure in vast regions limits the choice of location of industry. Reference has already been made to non-availability of power in many places. There is scarcity of other facilities as well - transport, communications, water, housing, etc. In economically advanced countries, small industries are often relied upon to play an important role in the planned distribution or dispersal of industries, and are successfully induced to be located in comparatively depressed areas. Even in such areas, the basic infrastructure for industrial development is available, and, given certain special incentives and support, small-scale industries may find such locations to be suitable. In the developing countries, outside of a few "islands" where prerequisites for industrial development exist, it may often be uneconomical to induce the establishment of small-scale industries, even though socio-economic objectives such as industrial decentralization and balanced regional development may be of primary importance. It is the duty of industrial extension agencies to provide guidance and advice on locations offering good prospects for establishment and growth.

The industrial estate may be of value - among other things - in facilitating the establishment of industries in the relatively less developed or backward areas, since it provides an economic justification for the development of basic facilities and services - power, water, transport, factory buildings, extension services, training and so on. Yet, even the location

of an industrial estate presumes the existence of a minimum of basic resources and facilities and of favourable prospects of industrial development, and should be decided on the basis of thorough surveys. 2/

## III. INSTITUTIONS AND METHODS FOR INDUSTRIAL EXTENSION SERVICE

### (1) Small Industry Service Institutes

Different techniques and methods of industrial extension service have been followed in different countries, and different institutions have emerged to provide such services. The most important among these is the small industry service institute which is a multi-purpose agency for guidance and counselling in the field of economics, technology, management and product improvement. The advantage of a polyvalent institution is that it is able to provide assistance in all fields to a great variety of small-scale industries. The main functions of a small industry service institute are usually the following:

(i) Conduct techno-economic surveys and advise potential entrepreneurs on prospects of establishment of small-scale industries and on suitable locations.

(ii) Prepare "model schemes" for industries of high priority.

(iii) Provide information on all matters of interest to small-scale industries through interviews, newsletters, bulletins, pamphlets, audio-visual aids, press, radio, etc.

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2/ It may be noted in this connexion that while an industrial extension agency may be set up independently of an industrial estate - as a rule in a location where there is, currently or prospectively, a concentration of small-scale industries - there are advantages in establishing it on an industrial estate as one of its common service facilities. The staff of an estate extension centre will promote the occupancy of the standard factory buildings and will lend assistance not only to the tenants but to all small-scale industries established in the surrounding area. As industrial estates are being established in various parts of a country, in particular in the less developed ones, the industrial extension centre will become the principal instrument of regional development, its action radiating beyond the limits of the estate.

(iv) Assist and advise small industries in obtaining supporting facilities and help from various sources such as government agencies, hire-purchase corporations, credit institutions, industrial estate authorities, etc.

(v) Advise on modern technical processes, machinery, and equipment.

(vi) Assist in obtaining, installing, operating, maintaining and repairing the machinery, selecting and procuring raw materials; advise on plant layout; work, time and motion study; quality control, etc.

(vii) Demonstrate the use of modern technical processes, machinery and material through workshops and laboratories.

(viii) Prepare designs, blueprints and specifications for machinery and parts, dies, jigs, tools, fixtures, etc.

(ix) Improve management in fields such as production planning and control, financial accounts, cost analysis, labour-management relations, etc.

(x) Provide counselling, guidance and information to small producers in the field of marketing and help them to establish contacts with wholesale and retail dealers and obtain dealers and consumers' reaction to price, quality and design of products.

(xi) Assist small producers to participate in the stores purchase programmes of government, public sector corporations, department stores, etc.

(xii) Assist small producers in producing components and parts for large industries according to standards, specifications and quality requirements.

(xiii) Conduct training courses for all categories of personnel of small-scale industries including entrepreneurs.

(xiv) Carry out research on problems relevant to small industry development and, where necessary, obtain the assistance of industrial research institutes, universities, research laboratories, etc.

To carry out these functions, a small industry service institute should have on its staff specialists and experts in a wide variety of subjects such as economic survey and analysis, engineering, business organization and management, training, marketing, and different branches of technology.

The extension personnel should have wide practical experience in modern technology and management at levels suitable to small-scale manufacturing, aptitude for research and for applying the results of research to the field. Finding the right type of personnel with the required experience and background, and obtaining proper balance in the various fields of qualification such as practical experience, aptitude for promotional work, extension service and research, is a major difficulty in organizing small industry service institutes and other extension service agencies.

Successful operation of a small industry service institute depends mostly on the qualifications, experience and suitability of its staff. A defect that has occasionally been noticed in the working of such institutions is that, after a few years, the staff tends to become bureaucratic, to lose touch with practical problems and to ignore new developments in their own discipline. Especially in such situations, refresher courses and seminars for the staff engaged in extension work are a necessity.

Another way of keeping the expertise of an institute up to date is to associate specialists and experts from other institutions and from private industry in its day-to-day work. No institute, however well staffed it may be, can hope to have experts in all fields and to meet all demands on its services from its clients, nor should it endeavour to do so. An institute should call upon the services of experts from private industry and other sources whenever its own staff cannot provide a particular service. For this purpose, it should maintain panels of experts on various subjects. Close contacts with outside experts will be of benefit for all concerned.

A small industry service institute should have its own workshops and laboratories for training, demonstration and research, located either in its own building or in an industrial estate - in which case these facilities should be operated by it - and mobile demonstration workshops. It should also make use, as necessary, of the facilities and services of private workshops and laboratories for its programmes of research, training and extension service.

(2) Extension Centres for Specific Industries

In areas where there is, because of availability of certain raw materials, skills, market and other factors, a concentration of certain types of industries, it may be justified to set up extension centres catering to the special needs of these industries. There may be, for example, extension centres for leather goods, agricultural implements, wood-working, sports goods, bicycles, etc. It will often be useful to set up such centres as branches of a small industry service institute in order to pool expert knowledge and certain technical facilities. The extension centres may have, in regard to a specific industry, all or most of the functions of a service institute, though they will generally tend to concentrate on technical assistance.

(3) Common Service Facility Centres

Sometimes, it may not be necessary to set up an extension centre to serve the needs of a community of industries, and provision of common service facilities may suffice. These are centres providing to small-scale industries technical services and facilities limited to certain aspects of their production or processing operations, for instance, electroplating, heat treatment, forging, foundry, dyeing, painting and so on. In the developing countries, small industries usually cannot afford to have their own equipment for all their operations, mostly because of scale and capacity limitations, but also because the use of certain facilities requires techniques and skills beyond their competence.

Common service facilities should be set up by an industrial extension centre if these cannot be provided on a commercial basis. This will frequently be the case when current demand is not sufficient to ensure economic operation of the facilities, but prospects exist for an expansion of demand through an increase in the number of industrial consumers. When this materializes, the common service facilities may be turned over to private enterprise, on an individual or co-operative basis.

Common service facilities are among the major features of industrial estates. By contributing to the reduction in costs and improvement in productivity and quality of products they serve the promotion and demonstration purposes of the estates. Some common service facilities, for instance, tool room, maintenance and repair shop, testing laboratory and information centre

may serve all or most industries on the estate; the type and number of other facilities depends upon the size and industrial composition, present and prospective, of the estate, and careful surveys are needed before they are established.

(4) Extension Service by Large Industries Under the Subcontracting System

Small industries engaged in subcontracting or ancillary relationships with large industries frequently receive technical guidance and counselling from the large firms. The degree and extent of extension services provided by the large firms depend on the nature of the contractual relations in each case. Sometimes there is no obligation whatever on the part of the large firm to provide technical guidance, and the firm is free to accept or reject the goods supplied by the ancillary units. In other cases the large firm considers that it is in its own interest to supply not only designs and specifications but also technical help and sometimes raw materials and some financing in order to ensure quality and uniformity in production and timely delivery. Technical guidance and supervision are facilitated when ancillary small industries are located in the vicinity of the large firm. The possibilities of subcontracting and of technical assistance on the part of the large firm are among the reasons which justify the establishment of industrial estates near large industries or the combination, on the same tract of land, of an industrial estate for small-scale industries and of an industrial area for large industries. An industrial extension agency has a role to play in stimulating the establishment of subcontracting relationships and in complementing the technical assistance given by the large firms.

(5) Itinerant Extension Teams

A small industry service institute or an industrial extension centre can reach only a comparatively limited number of entrepreneurs located in the surrounding area. Their services may be extended beyond this area by organizing itinerant extension teams and mobile demonstration projects. The teams pay more or less prolonged visits to small enterprises to diagnose their problems, suggest remedial measures and help in applying these. Promotional and demonstration work is carried out at the same time.

Itinerant teams may also hold "marketing clinics" to help in the sale or export of small industry products. Entrepreneurs are encouraged to bring in their products for exhibition at selected centres and the teams of experts examine their design, quality, packing and other features and provide guidance and advice to improve their marketability.

The technique of itinerant extension teams is particularly useful in countries where industrial development is dispersed over wide areas. It may not be practicable and even necessary to establish extension centres or branches of small industry institutes to cover all industrial centres in a country. Itinerant teams can take care of the principal centres and the small industrialists will have the additional advantage of getting extension service at their own doors.

(6) Production and Training Centres

Production and training are combined in centres where actual industrial operation conditions are reproduced as accurately as possible, so that training may be carried out as an integrated part of the production process, a condition which does not obtain in ordinary training centres. It is because training and instruction are more realistic in a production and training centre that this method of extension service has been recommended in certain situations.

In actual practice, a number of production and training centres set up in developing countries have been only moderately successfully, their main defect being that they operate neither as efficient production centres nor as efficient training centres. The production process can never be effective and realistic with a labour force of trainees who are still learning their trade, and the major objective of the centre is often defeated. Furthermore, training of this type is relatively expensive and, on this ground alone, may not be the best suited for developing countries. Apprenticeship and in-plant training as a complement to regular training appear to be preferable solutions.

(7) Prototype Production and Training Centres

A new type of institution - the prototype production and training centre - has been tried in India in recent years. Three centres have been set up in, respectively, Rajkot (Gujrat State), Okhla (Delhi) and Howrah (Calcutta), with the objective of developing and producing prototype machinery and training

the operative staff of small enterprises in producing such machinery on commercial lines; training is also given to the technical staff of the government extension services so that they may assist effectively the small units in planning and implementing production programmes.

Prototypes of machines, implements, tools, accessories and component parts which can be manufactured by small-scale industries are developed by research adaptation or copying. Training is provided in the workshops of the centres, blueprints and designs are made available to small units and assistance is continued, if need be, at the factory. The objective is to impart to small industrialists the relatively complex techniques involved in manufacturing producers goods. It is considered, no doubt with good reason, that in the absence of specialized training and assistance, the production of these goods, important as it may be for the country's economy, would not be taken up by small-scale industries.

Since the experiment of prototype centres is comparatively new, their usefulness cannot be fully evaluated. However, one evident drawback is that they require considerable machinery and equipment and a large staff, and are therefore a costly means of providing extension services. The development, trial and testing of prototypes of various types demand an investment in machinery and equipment similar to, if not larger than, that of a regular production unit. To be realistic, training of teams of workers of several small enterprises calls for a large number of instructors and other staff; so does research and experimentation.

While the objective of the centres is undoubtedly sound, it may be asked whether the combination of functions relating to prototype development on the one hand and training on the other is necessary and whether they are an economic method of extension service suitable to conditions of developing countries. In India, where the three centres are well equipped and well staffed, there has been some spare capacity which has been utilized for commercial production, job orders, common servicing and general training of skilled workers and supervisors from small industries. Here again, further experience is needed to appreciate the reasons for the existence of spare capacity and the effectiveness of the means adopted for utilizing it. The existing information suggests that there might perhaps be advantages if training were dissociated from prototype research and development, the latter

being the only function of the centres. On the basis of the prototypes and blue-prints prepared by the centres, training might well be provided by other institutions or by private industries, and assistance to the producers may be given by small industry service institutes and industrial extension centres.

(8) Industrial Research Institutes

Industrial research institutes are primarily concerned with research and development of local raw materials, new processes and improvement of existing ones, new products or new uses for existing products, industrial productivity, standards and specifications, choice of technology, scale of operation, etc. In many cases industrial research institutes provide economic and technical counselling and guidance to industry, including feasibility studies, market development and so on. In developing countries, such institutes can also play a very useful role in providing extension services and facilities to industries, particularly small industries. In small countries, or in countries having difficulties in finding suitable personnel for industrial development work, it may be advantageous to combine extension functions with those of the research institutes so that the latter function as multi-purpose industrial development organizations.

For obvious reasons, industrial research institutes are concerned with problems of industry in general. Industrial research benefits industries of all sizes including small-scale industries. As a rule, extension service is needed by the smaller establishments and industrial research institutes providing it have to adopt suitable techniques and methods.

When there are separate agencies for extension service to small industries, close co-operation and co-ordination should be maintained with the work of industrial research institutes. In many cases small industry institutes and extension centres may provide technical assistance on behalf of the industrial research institutes. They can refer to the latter problems with which they cannot deal themselves and in turn carry to the field the results of research from the institutes. Proper co-ordination will ensure economies and better servicing for all concerned.

The need for similar co-ordination and co-operation between different institutions for industrial extension service such as small industry service institutes, extension centres, common service facility centres, prototype centres, etc. cannot be over-emphasized.

## IV. SPONSORSHIP AND MANAGEMENT

In the developing countries, industrial extension agencies should, as a rule, be sponsored and financed by the Government, since small-scale industries can hardly be expected to organize, finance and carry out themselves comprehensive promotion and assistance programmes. Management of the agencies, on the other hand, should be entrusted to an autonomous body rather than to a government department. Autonomy would ensure flexibility in operation, a very important consideration in an activity characterized by a great variety of needs on the part of the clients, and requiring, on the part of the staff, much versatility, mobility and a good deal of initiative. In general, government departments are not characterized by prompt adjustment to varying needs in their day-to-day operations. In government-operated extension agencies, the tendency is often for technical and other staff to function as administrators and custodians of rules and regulations rather than experts in their field of competence. Government rules and regulations regarding recruitment of staff sometimes make it difficult to select the right personnel for extension service, whether permanent officials or short-term consultants, and those regarding termination sometimes raise obstacles to the replacement of persons who have not proved to be useful for this type of service. An autonomous agency, on the other hand, is in a better position to formulate programmes, recruit, train and deploy staff, decide on procedures and techniques of extension work for different industries and at different locations. Particularly for its promotion work, the agency should have the discretion and authority of an independent body. Its consultations with entrepreneurs, especially as regards management problems, should be private and confidential. Some latitude in its financial procedures, within the limits of its budget, is necessary if its work is to be carried out promptly and efficiently. The Government's role, in addition to financing, should be to lay down the over-all policies for industrial extension service and to give general directions on programmes without controlling their day-to-day implementation.

A close association should be maintained between autonomous industrial extension agencies and other organizations serving or representing industry. One means of achieving this is to organize an advisory council for an extension agency, in which the interests of different other bodies concerned with industry would be represented.

More generally, the services of an industrial extension agency would be considerably enhanced if supported by complementary action on the part of private groups, such as chambers of commerce and industry, industrial associations, co-operatives of small industrialists and the like. The main objective of these groups is to serve their members on a voluntary basis and to foster mutual assistance. They generally operate on a "no-profit no-loss" basis. Extension work by such groups should be encouraged and assisted by the Government, for instance through grants or loans, or by allowing the use of the facilities of government workshops, laboratories and information services.

In some countries, extension service is provided by mixed sponsorship institutions jointly organized by government and private groups. These are usually set up on the initiative of commercial banks and other such institutions which feel the need to improve the technical and management efficiency of the small borrowing firms. Extension services are then part of supervised credit operations. In other countries, extension services are provided, for the same purpose, by government financial institutions.

In a few developing countries which have reached relatively high stages of industrial development, industrial servicing and consultancy are provided by profit-motivated commercial firms. Their clients are usually the larger industrial enterprises, but some small-scale industries able and willing to pay for consultations also avail themselves of their services.

As small-scale industries achieve a sufficient level of development in a particular area, consideration may be given to transferring to private promotion groups all or part of the industrial extension services originally set up by the Government. In such cases, charges will need to be levied for the services - as a rule, on a non-profit base - though some subsidization and technical assistance may still remain necessary.

In general, industrial extension services provided by Government agencies should be given free of charge. Industrial extension service is primarily intended for a class of people who are not able to afford such services and facilities out of their own resources, at any rate in the early stages, and have to look up to the Government for help. Payment for services and facilities may be considered after small-scale industries have acquired sufficient strength and stability.

A common argument against making extension service free is that it will encourage irresponsibility among the industrialists and lower the quality of the service. If the service is free, there may be a tendency on the part of the industries to ask for it indiscriminately. The resources and staff of the extension agencies are limited and the services offered by them will lack in quality and depth if they are to meet every demand placed on them. The extension services will thus be forced to make their services spread over too wide an area, and the needs and requirements of the really deserving may often be ignored. At the same time, it is argued, the obligation to pay for the services will make the industries more responsible and discriminatory in asking for such services.

These arguments are likely to be valid only in countries which have achieved appreciable progress in industrial development. In countries which are truly under-developed, there will be few industrialists asking for extension services. The problem in such countries, as already stated, is primarily one of promotion of entrepreneurship, and industrial extension agencies have to take the initiative and leadership in seeking out potential entrepreneurs. Even in more advanced countries, many existing small industries are unable to identify their own problems and it is up to the extension agencies to take the initiative and to assist such units without waiting to be asked for. An obligation to pay would discourage many small industries from getting the assistance they need and deserve, and would defeat the very objectives of the programme. It will, therefore, be advisable to make industrial extension service free for small industries in the early stages of the programme.

However, there is justification, even in the less developed countries, for providing some of the services on a payment basis. For example, industries which avail themselves of the services of common facility centres can well be expected to contribute towards their costs, since these may be considered as direct operating costs. Here again the amount of the payment to be made by the industry is a policy matter for each Government to decide. The industries may pay the full cost or only make a contribution towards the cost. In most countries, such facilities are offered by the Government on a no-profit no-loss basis.

When institutes for extension service are sponsored and managed by non-government bodies, the clients will invariably have to pay for all categories of services they get from them. In such cases, Governments can assist small industries by subsidizing part of the costs.

The policy and aim of all industrial extension agencies, including those sponsored and managed by Governments, should be to make the services self-supporting in the long run. The question as to when and how much payment should be levied from the clients is to be decided according to the circumstances in each country.

## V. TRAINING OF EXTENSION WORKERS

A comprehensive industrial extension programme requires the services of production technologists, management specialists, industrial economists and administrators. These extension workers have not only to be well-versed and up-to-date in their subjects of specialization, but also trained in methods of extension and communication, to enable them to promote entrepreneurship and to transfer effectively modern knowledge and improved techniques of management and production.

In newly industrializing countries it is difficult to obtain the services of qualified national personnel; the few that are available are often attracted by the higher salaries offered by private enterprises and organizations as compared to Government and semi-public organizations. Moreover, some technicians may lack practical experience in the operation of industrial enterprises and in methods of industrial extension.

In building up an industrial extension service a developing country has, therefore, to formulate from the very beginning in-service training programmes, refresher courses, seminars and fellowships for its staff, in order to build up the cadre of extension personnel and constantly to upgrade their skills. Foreign or international experts recruited for organizing or establishing an industrial extension service should not only train suitable counterparts, but also help organize such programmes.

Broadly speaking, extension personnel need two types of orientation and training. Firstly, all extension personnel need orientation in development economics, principles and methods of management and techniques of extention and communication. Secondly, extension personnel need to bring themselves up to date on both theoretical and practical developments in their field of specialization, so as to be able to provide the most appropriate advice and assistance in the light of the needs and requirements of the country.

The first type of training, namely, orientation in principles and methods of development, management and extension, has to take into account the economic, social and cultural milieu in the particular country or area, and, therefore, could best be arranged within the country, with the assistance of foreign experts, wherever necessary. Depending on the number of personnel involved, the orientation could be arranged as on-the-job training, as a seminar or as a training-course. When an industrial extension service is being planned in a newly industrializing country, it would be useful to send a few selected national personnel on study-visits to countries which have developed extension services and institutions in the context of comparable economic-social situations. Initial orientation to extension personnel should be supplemented by refresher courses and seminars, at least once a year, when extension personnel should have the opportunity to exchange experiences among themselves and with a few industrialists and experts, who could infuse new ideas.

The second type of training, namely, bringing up-to-date knowledge and techniques in different specialized fields, for instance, foundry practice, tool and die making, cost accounting, area survey, and technologies of various types could be undertaken through (a) organization of seminars in the specialized field, which will bring together the competent personnel of the extension service, of research institutions or of large-scale industry, works managers or other supervisory personnel from industrial undertakings, standardization engineers, purchase or marketing officers, and other experts; the seminars should be the forum for discussion of operational problems, analysis of new technological developments and application of new techniques towards the solution of practical problems; (b) award of fellowships to key extension personnel to study and learn advanced methods and techniques in an industrial enterprise, a research institute, a university, a financial institution or a development agency, either within the country or abroad.

The training provided to the officers of the Central Small Industries Organization in India, which provides one of the most comprehensive extension services to small-scale industries, anywhere in the world, illustrates the types of training required. The officers of the organization are given institutional training, in-plant training and supervisory training in the country

as well as abroad. A typical programme includes courses in industrial management and area development for twelve weeks in the Small Industry Extension Training Institute in Hyderabad; training of six-month duration in welding, electroplating, turning, machining, sheet metal, pattern making, foundry, etc. at the Prototype Production and Training Centres at Rajkot and Okhla; in-plant training in chemicals, plastics, paints and varnishes and footwear technology in large-scale enterprises in the country; and training in small business management, leather technology, marketing, foundry practice, tool room practice and other subjects in the United Kingdom, the United States of America, West Germany, Japan, Poland and the Union of Soviet Socialist Republics for durations varying from six to twenty-four weeks.

Training courses in the field of small-scale industry which could be availed of by extension personnel of developing countries, are conducted in a number of institutions, among which are the Asian Productivity Organization Tokyo, Japan; the International Centre for Advanced Technical and Vocational Training, Turin, Italy; and the Research Institute for Management Science, Delft, the Netherlands. Training specially devised for extension workers is provided by the Small Industry Extension Training Institute, Hyderabad, India.

A number of trainees have attended the courses of these institutions under fellowships granted by the United Nations, the International Labour Organisation, bilaterial and multilateral assistance programmes, and individual Governments, including the Government of the country where the institution is set up.

Asian Productivity Organization (Japan)

The Asian Productivity Organization organizes for participants from member countries training courses, seminars, symposia, study-tours and individual fellowship programmes on various aspects of small industry development. It conducts regularly a six-month training course for Small Business Management Trainers and Consultants. One-third of the course covers lectures and seminars and the remaining two-thirds plant visits, field training and individual study. It also conducts an eight-week Small Industries Development Administrators Course, devoted to problems of and measures for the development of small industries, through lectures, discussions and visits. Training

courses or Seminars are also conducted on specialized subjects such as preventive maintenance, marketing, quality control, etc. The courses are conducted in English.

International Centre for Advanced Technical and Vocational Training (Italy)

This Centre is an agency of the International Labour Organization, which conducts courses of three to six months in a dozen technical fields from diesel engine maintenance to electronic data processing. The courses include study of techniques as well as of teaching methods related to the technology. Practical experience is provided in cooperating industries in Italy. Instruction is in English, French and Spanish. Fellowships are awarded by the ILO to personnel from developing countries already trained and engaged in practical instruction or management work.

Research Institute for Management Science (The Netherlands)

The Institute conducts in the English language two international courses of six months duration each per year in small-scale industries. The course, which is at the post-graduate level, provides both theoretical and practical training in investigation and solving the specific management problems of small-scale industries and in the methodology which can be applied to the establishment and promotion of new industries. The course caters to extension officers, development administrators and managers from developing countries.

Small Industry Extension Training Institute (India)

The Institute, which is primarily a staff training college for the extension officers in India, provides courses in area development and industrial management, which are held simultaneously for twelve weeks each. Three courses in each field are offered each year in the English language and are now open to participants from other developing countries as well. The area development course provides both classroom and field training in methods of area and industry surveys; selection of industries, locations and entrepreneurs; methods of industrial development and promotion; planning and management of new enterprises. The industrial management course provides both classroom and in-plant training in management principles, methods and techniques as

applied to small-scale enterprises. Besides these two general courses, specialist courses in advanced production management and management accounting, each of three months duration, are also being conducted. The courses are suitable for extension personnel, development administrators, and managers of enterprises.